

BRIEFER ARTICLES

TISSUE TENSION IN AMORPHOPHALLUS

(WITH ONE FIGURE)

Large monocotyledonous plants which do not develop woody mechanical tissue afford excellent opportunity to demonstrate the tension to which cortical and central tissues are subjected. The combined result of the stretching of the cortex and the compression of the central tissues is the rigidity of the organ.



FIG. 1.—Leaf of *Amorphophallus campanulatus*

Such a plant in the Philippine Islands is *Amorphophallus campanulatus* (Roxb.) Blume (Araceae). The decomposed blade may often be more than a meter above the ground and occasionally spreads out over an area 1.5–2 meters in diameter. The stemlike petiole, which is often 10 cm. in thickness, is the part utilized in studying tissue tension.

Two sets of experiments were performed. In the first set, medium sized petioles were collected in the middle of a hot day, when the plant was partly flaccid, brought into the laboratory, and there experimented upon during the following hour. In each case a piece 30 cm. in length and as nearly uniform in thickness as possible was selected from the petiole. A strip of the cortex, 1 cm. wide, was taken from one side of

the petiole and laid on a table. The rest of the cortex was peeled off and the core laid next to the strip. When the elongation of the core and the contraction of the strip had ceased, both were measured and the results assembled. For the second set of experiments, petioles were collected in the early morning and soaked for about 40 minutes in tap water to make sure that they were turgid. In the experiment three lengths were employed: 20, 25, and 30 cm., with each following the same methods as above. The results of both sets, summarized in tabular form, are shown in the accompanying table.

TABLE I

TABLE OF TISSUE TENSION IN *Amorphophallus*

NUMBER OF PLANTS	LENGTH			PERCENTAGE INCREASE IN CORE	PERCENTAGE DECREASE IN STRIP
	Original	Core	Strip		
	Petioles partly flaccid				
1....69.....	30.0	31.6	29.4	5.3 per cent	2.0 per cent
	Petioles turgid				
2a...12.....	20.0	21.7	19.8	8.5	1.0
2b...12.....	24.7	26.8	24.5	8.4	0.8
2c...12.....	30.0	32.5	29.7	8.3	1.0
Average of turgid petioles				8.4	0.9

As shown in the table, the core is capable of greater elongation when turgid, but the cortex will contract more when flaccid. The possibility of change in length in the core is greater than in the cortex because the former is more vascular. In the petiole, in nature, under turgid conditions, the sum of the possibilities of change in length of the tension-producing elements is greater than when the organ is flaccid, consequently greater tissue tension is present under turgid conditions.—FRANK C. GATES, *Los Baños, P.I.*